dataTaker

DT80 Series 3 Data Logger

Intelligent Data Logging Products

- Dual Channel Isolation Technology
- 2 Serial 'Smart Sensor' ports
- FTP for automatic data transfer
- Up to 15 Analog (± 30V) sensor inputs
- Expandable to 300 analog inputs
- Modbus for SCADA connection
- SDI-12 (multiple networks)
- USB memory for easy data and program transfer

Applications include:

Research & Development	Structural Monitoring	Vehicle Testing
Agricultural Research	Strain Gauges	GPS
Weather Stations	Process Monitoring	CANgate (optional)
Total Energy Monitoring	Fault Identification	– CAN bus
Environmental Monitoring	Machine Down Time	– J1939
Temperature Profiling	Pressure	– OBDII
Thermistor Arrays	Load Cells	
Aquaculture	Flow	

***FREE** Software & Technical Support*

The Smarter Solution

The *dataTaker* DT80 smart data logger provides an extensive array of features that allow it to be used across a wide variety of applications. The DT80 is a robust, stand alone, low power data logger featuring USB memory stick support, 18 bit resolution, extensive communications capabilities and built-in display. The *dataTaker* DT80's Dual Channel concept allows up to 10 isolated or 15 common referenced analog inputs to be used in many combinations. With support for multiple SDI-12 sensor networks, Modbus for SCADA systems, FTP and Web interface, 12V regulated output to power sensors, the DT80 is a totally self contained solution.

Versatile Measurement

Connect an array of sensors through the versatile Analog and digital channels, high-speed counter inputs, phase encoder inputs, programmable serial sensor channels and the optional CANgate interface available for CAN bus applications. Temperature, voltage, current, 4-20mA loops, resistance, bridges, strain gauges, frequency, digital, serial and calculated measurements can all be scaled, logged and returned in engineering units or within statistical reporting. Set up sampling, logging, alarm and control tasks to suit your own requirements while interfaces for smart sensors, GPS and other intelligent devices expand the DT80 flexibility.

Superior Data Storage & Communications

With the standard unit able to store up to 10 million data points (expandable) you can log as much or as little as you need. Overwrite or stop logging once allocated memory is full, archive data on alarm event, copy to USB memory or transfer via FTP, the choice is yours. Communications features include RS232, USB and Ethernet, connect to the DT80 locally, remotely through a modem or over the Internet. The web interface allows users to configure the DT80, access logged data and see current measurements as mimics or in a list using a web browser. FTP provides data to your office over the internet or mobile phone network, without the need for polling or specific host software.

***Warranty:** All dataTaker Data Loggers are covered by a 3 year warranty on workmanship and parts. For further information on the dataTaker range, or for useful downloads, visit the dataTaker web site at www.datataker.com or contact your nearest dataTaker office or distributor.*
***Quality Statement:** dataTaker operates a Quality Management System complying with ISO9001:2008.It is dataTaker's policy to supply customers with products which are fit for their intended purpose, safe in use, perform reliably to published specification and are backed by a fast and efficient customer support service.*
***Trademarks:** dataTaker is a registered trademark .*
Specifications:** dataTaker reserves the right to change product specifications at any time without notice.* ***Designed and Manufactured in Australia.

**Our ability to provide free software and support is dependent on applicable export control laws (including those of the United States) and the export policy from time to time of Thermo Fisher Scientific Inc.*

www.datataker.com

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dEX Logger Software

» Built-in software - no application to install

» Runs directly from your web browser

» Accessible by Ethernet or USB[1] connection

» Intuitive graphical interface

» Easy-to-use configuration editor

» Access live and historical data

» View data as charts, mimics and tables

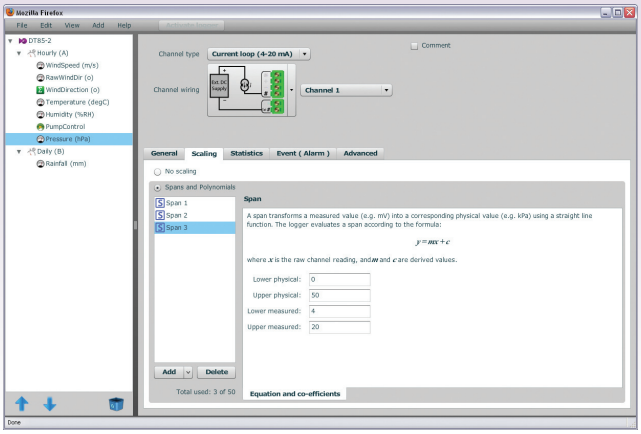
What is dEX?

dEX is an intuitive graphical interface that allows you to configure your data logger, view real-time data in mimics, trend charts or tables and retrieve your historical data for analysis.

dEX runs directly from your web browser and can be accessed either locally or remotely, anywhere that a TCP/IP connection is available including worldwide over the Internet. You can use any of the logger's built-in communications ports to view dEX including Ethernet, USB[1] and RS-232.

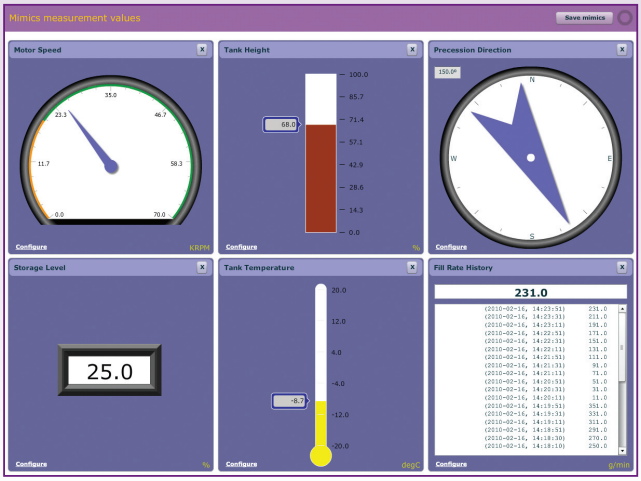
Easy configuration

The dEX configuration editor allows you to view, edit and save logger configurations in an easy-to-use Windows Explorer style user interface.



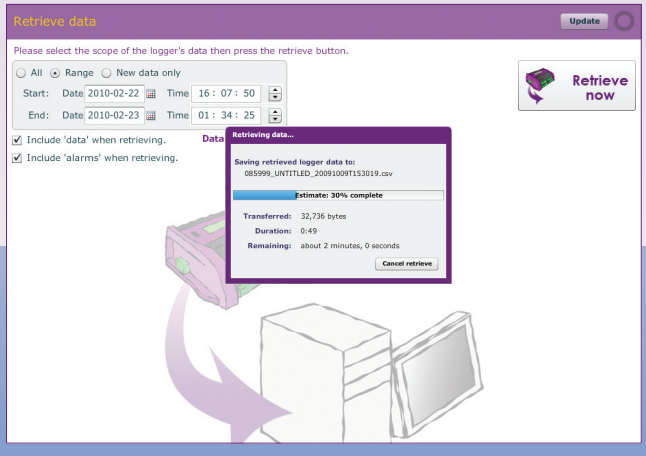
Real-time monitoring

dEX displays real-time sensor measurements, calculations and diagnostic information using mimics, tables and trend charts.



Data retrieval

dEX allows you to retrieve your data at the click of a mouse button. Just select either All, Range or New Data Only.



Browser-based solution

dEX comes pre-installed on every logger in the DT80 range[2]. The software loads in your web browser so there is no need to install cumbersome applications on your computer. Being browser-based, dEX is cross-platform and will work on all major operating systems including Windows, Mac and Linux. To simplify it even further, dEX starts automatically in your default web browser when you connect to your logger using a USB cable[1].

Data that is compatible with your applicatons

Logged data is ready to import into common spreadsheet and data processing applications such as Excel for further analysis and reporting. Data can be saved to your computer in comma separated (.CSV) format or our proprietary binary (.DBD) format.

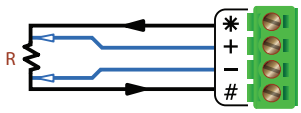
Command window

The command window provides a terminal interface which allows the built-in command language of the logger to be used. Macro buttons allow common commands to be sent on a button press.

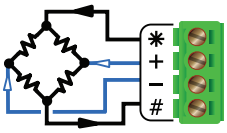
Configuration editor

The configuration editor allows you to view, edit and save logger configurations in an easy-to-use Windows Explorer style user interface. Tree view of configuration allows definition of measurement schedules and measurements.

Wiring diagrams show available wiring configurations for each sensor type. Configuration can be stored and retrieved on either the logger or a local computer.



Platinum RTD (4 wire)



Voltage bridge (+ / #)

Channel list

Displays name, value, units, alarm state, time stamp and logging state for each measurement.

Run	Name	Value	Units	Alarm	Time stamp	Log
✓	1hr_Humidity	51	%RH		2010-02-02, 12:00:00	✓
✓	1hr_Mean Win	0	m/s		2010-02-02, 12:00:00	✓
✓	1hr_Mean Win	7			2010-02-02, 12:00:00	✓
✓	1hr_Pressure	1006	hPa		2010-02-02, 12:00:00	✓
✓	1hr_Temperatı	23.6	Deg C		2010-02-02, 12:00:00	✓
✓	1min_Humidit	48	%RH		2010-02-02, 12:32:00	✓
✓	1min_Mean Wi	0	m/s		2010-02-02, 12:32:00	✓

Customisation of the application

The menu options, mimics panels and mimics can be added or removed to suit novice or advanced users. The color and brand name images within dEX can be customised to match corporate requirements or for personal preference.

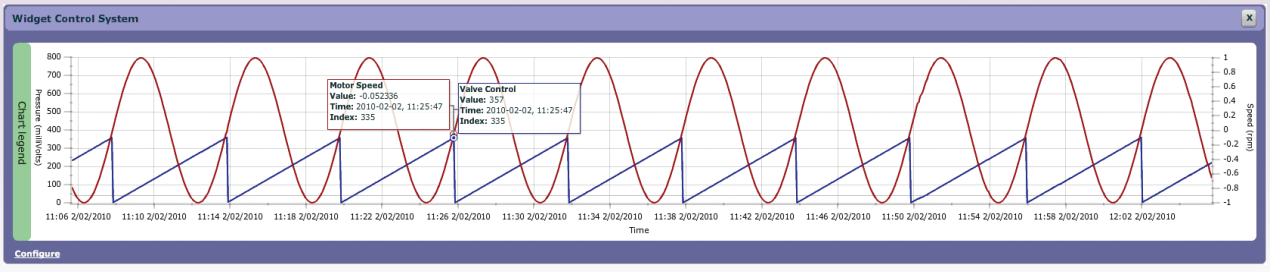
Mimics are organised into panels which can be modified to highlight custom alarm conditions or data grouping. Mimics include dials, bar graphs, thermometers etc. Real-time chart recorder mimic allows you to view trends and historical data over a custom time/date range. Up to 16 mimics can be displayed on up to 5 mimic pages (default is 1 page of 6 mimics).

Minimum system requirements

- Web Browser (tested with): Internet Explorer V7 and above, Firefox, Safari & Google Chrome
- TCP/IP connection
- Adobe flash player 10 or higher
- Screen resolution of 1024 x 768

Chart recorder mimic

Real-time trending for sensors, calculations or other data. Supports up-to 5 traces per chart and up-to 2 Y-axes. Backfills with historical data stored in logger.



1. USB port equipped models only.
2. dEX operates on all DT80 range Series 2 & Series 3 models (DT80, DT81, DT82E, DT85, DT80G, DT85G). The latest firmware which includes dEX is available for download from the dataTaker website. DT80 range Series 1 models do not support dEX.

*The difference is **dEX!***

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Technical Specifications

Analog Channels

5 analog input channels (expandable to 100*)
Each channel is independent and supports: one isolated 3-wire or 4-wire input, or two isolated 2-wire inputs, or three common referenced 2-wire inputs.
The following maximums apply.
Two wire with common reference terminal:
15 (expandable to 300*)
Two wire isolated: 10 (expandable to 200*)
Three and four wire isolated: 5 (expandable to 100*)
*Expansion requires optional CEM20

Fundamental Input Ranges

The fundamental inputs that the DT80 can measure are voltage, current, resistance and frequency. All other measurements are derived from these.

Full Scale	Res olution	Full Scale	Resolution
±30 mVdc	0.25 µV	100 Ω	1.5 mΩ
±300 mVdc	2.5 µV	1000 Ω	15 mΩ
±3 Vdc	25 µV	10,000 Ω	150.00 mΩ
±30 Vdc	250 µV	100 Hz	0.0002 %
±0.3 mA	2.5 nA	10 kHz	0.0002 %
±3 mA	25 nA		
±30 mA	250 nA		

Auto-ranging is supported over 3 ranges.

Accuracy

Measurement at ...	5°C to 40°C	–45°C to 70°C
DC Voltage	0.1%	0.35%
DC Current	0.15%	0.45%
DC Resistance	0.1%	0.35%
Frequency	0.1%	0.25%

Accuracy table above is % of reading ±0.01% of full scale.

Sampling

Integrates over 50/60Hz line period for accuracy and noise rejection
Maximum sample speed: 25Hz
Effective resolution: 18 bits
Linearity: 0.01%
Common mode rejection: >90dB
Line series mode rejection: >35dB

Inputs

Inter-Channel Isolation: 100V (relay switching)
Analog Section Isolation: 100V (opto-isolated)
Input impedance: 100KΩ, >100MΩ
Common mode range: ±3.5V or ±35V on 30V range

Sensor Excitation (Supply)

Analog channels: selectable 250µA or 2.5mA precision current source, 4.5V voltage source, or switched external supply
General Purpose: Switchable 12V regulated supply for powering sensors & accessories (max 150mA)
Switchable 5V regulated supply for powering analog sensors (max 25mA)

Analog Sensors

Supports a wide range of sensors including, but not limited to, those listed below. A wide range of sensor scaling and linearising facilities including polynomials, expressions and functions.

Thermocouples

Types: B, C, D, E, G, J, K, N, R, S, T
Calibration standard: ITS-90

RTDs

Materials supported: Pt, Ni, Cu
Resistance range: 10Ω to 10KΩ

Thermistors

Types: YSI 400xx Series, other types*
Resistance range: <10kΩ**

* Other thermistor types are supported by thermistor scaling and calculated channels.

**Resistance range can be increased with the use of a parallel resistor.

Monolithic Temperature Sensors

Types supported: LM34 - 60, AD590, 592, TMPxx, LM135, 235, 335

Strain Gauge and Bridge Sensors

Configurations: ¼ , ½ & full bridge
Excitation: voltage or current

4-20mA Current Loop

Internal 100Ω shunt or external shunt resistor

Digital Channels

Digital Input/Outputs

8 bi-directional channels
Input Type: 8 logic level (max 20/30V)
Output Type: 4 with open drain FET(max: 30V, 100mA), 4 with logic output.

Relay Output

1 latching relay, contacts (max: 30Vdc, 1A)

Counter Channels

Low Speed Counters

8 counters shared with digital inputs.
Low speed counters do not function in sleep mode.
Size: 32 bit Max Count rate: 10 Hz

Dedicated Counter Inputs

4 high speed or 2 phase encoder (quadrature) inputs
Size: 32 bit Max Count rate: 100 kHz
Input type: 2 logic level inputs (max ±30V), 2 sensitive inputs (10mV) for magnetic pick-ups (max ±10V)

Serial Channels

SDI-12

4 SDI-12 inputs, shared with digital channels. Each input can support multiple SDI-12 sensors.

Generic Serial Sensor

Flexible options to allow data to be logged from a wide range of smart sensors and data streams.
Available ports: Serial Sensor Port (RS232, RS422, RS485) or Host RS232 Port*
Baud rate: 300 to 115,200

*If used as a Serial Sensor channel then the Host Port is not available for other communications.

Calculated Channels

Combine values from analog, digital and serial sensors using expressions involving variables and functions.
Functions: An extensive range of Arithmetic, Trigonometric, Relational, Logical and Statistical functions are available.

Alarms

Condition: high, low, within range and outside range
Delay: optional time period for alarm response
Actions: set digital outputs, transmit message, execute any *dataTaker* command.

Scheduling of Data Acquisition

Number of schedules: 11
Schedule rates: 10ms to days

Data Storage

Internal Store

Capacity: 128MB = approx 10,000,000 data points
Larger storage available refer to technical support.

Removable USB store device (optional accessory)

Types: compatible with USB 1.1 or USB 2.0 drives, e.g. Flash drive.
Capacity: approx. 90,000 data points per megabyte.

Communication Interfaces

Ethernet Port

Interface: 10BaseT (10Mbps)
Protocol: TCP/IP, Modbus (Master & Slave)

USB Port

Interface: USB 1.1 (virtual COM port)
Protocol: ASCII command

Host RS232 Port

Speed: 300 to 115,200 baud (57,600 default)
Flow Control: Hardware (RTS/CTS), Software (XON/XOFF), None
Handshake lines: DCD, DSR, DTR, RTS, CTS
Modem support: auto-answer and dial out
Protocols: ASCII Command, TCP/IP (PPP), Modbus (Master & Slave), Serial Sensor

Serial Sensor Port

Interface: RS232, RS422m, RS485
Speed: 300 to 57,600 baud
Flow Control: Hardware (RTS/CTS), Software (XON/XOFF), None
Protocols: Modbus (Master & Slave), Serial Sensor

Network (TCP/IP) Services

Uses Ethernet and/or Host RS232 (PPP) ports

Command Interface

Access the ASCII command interface of the DT80 via TCP/IP

Web Server

Access current data and status from any web browser. Custom pages can be defined. Download data in CSV format. Command interface window. Define mimic displays.

Modbus Server (slave)

Access current data and status from any Modbus client (e.g. SCADA system)

Modbus Client (master)

Read/write data from modbus sensors and devices including PLC's, dataTaker loggers, modbus displays etc.

FTP Server

Access logged data from any FTP client or web browser

FTP Client

Automatically upload logged data direct to an FTP server

System

Display and Keypad

Type: LCD, 2 line by 16 characters, backlight.
Display Functions: channel data, alarms, system status.
Keypad: 6 keys for scrolling and function execution.
Status LEDs: 4 for sample, disk, attention and power.

Firmware Upgrade

Via: RS232, Ethernet, USB or USB disk.

Real Time Clock

Normal resolution: 200µs
Accuracy: ±1 min/year (0°C to 40°C), ±4 min/year (-40°C to 70°C)

Power Supply

External voltage range: 10 to 30Vdc
Internal battery: 6Vdc 1.2Ahr lead acid
Peak Power: 12W (12Vdc 1A)

Average power Consumption

Using 12Vdc external power source

Sampling Speed	Average Power
1 second	1350 mW
5 second	500 mW
30 second	135 mW
5 minutes	70 mW
1 hour	60 mW

Typical Operating Time

From internal 6Vdc, 1.2Ahr battery

Sampling Speed	Operating Time
1 second	6.5 hours
5 second	1 day
1 minute	10 days
1 hour	3.5 months

Physical and Environment

Construction: Powder coated zinc and anodized aluminum.
Dimensions: 180 x 137 x 65mm
Weight: 1.5kg (4kg shipping)
Temperature range: –45°C to 70°C *
Humidity: 85% RH, non-condensing

*reduced battery life and LCD operation outside range –15°C to 50°C

Accessories Included

Resource CD: includes software, video training and user manual.
Comms cable: USB cable
Line adaptor: 110/240Vac to 15Vdc, 800mA

For full technical specifications download the user's manual from our website www.datataker.com.

Your local distributor

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TS-0059-F1